

A close-up photograph of Carolyn Duran, a woman with blonde hair, wearing wooden-rimmed glasses. She is looking intently at something out of frame. The background is blurred, showing other people in a crowd.

# Carolyn Duran

A photograph showing a pair of hands holding a young child. The child is wearing a patterned garment. The image is overlaid with a dark blue, ethereal digital or network-like pattern of glowing lines and nodes, suggesting a connection between technology and humanitarian aid.

An engineering solution to a humanitarian problem

When you answer your mobile phone, you most likely don't associate the device in your hand with civil war in the Democratic Republic of Congo (DRC). When you update Facebook or post a photo on Instagram, you probably don't pause to consider the source of the raw materials that went into manufacturing your laptop.

Carolyn Duran (PhD '98) does. The conflict minerals program manager and supply chain director at Intel Corporation ponders such questions every day, all the time. Why? Because nearly every piece of technology in use today contains four minerals—tantalum, tin, gold, and tungsten—all mined in the DRC, and Duran's job is to ensure that the materials that go into Intel's chips are not being produced by slave labor or funding warlords in the region.

"Even though those four metals are used in automobiles, aircraft, and appliances, the spotlight has been on cell phones recently because they're everywhere," she explains. "You certainly don't think the phone in your hand could be funding conflict half a world away."

Over the past five years, Duran and her team have applied engineering skills to solve a complicated supply chain problem. Thanks to their efforts, Intel is now manufacturing conflict-free microprocessors.

### Love of science and a stubborn streak

"I was always a math and science person in school. My parents certainly weren't engineers or scientists. I broke the cycle and went into science. I'm kind of proud of that," she laughs.

Duran didn't have much support for her career decision from female mentors early on. When she announced in high school that she wanted to be an engineer, her guidance counselor suggested a more traditional women's field, like nursing. She says it was her stubborn streak that emboldened her to break through the barriers of other people's expectations.

After receiving her BS in materials science and engineering from Carnegie Mellon University, Duran went on to McCormick's PhD program.

"McCormick's materials science and engineering department was among the top in the country, but it was the program and the professors that got me excited most," she remembers. "I really enjoyed the program there, so much that now I sit on the school's academic advisory board for materials science."

### An engineering approach to problem solving

Duran says she loves the straightforward nature of engineering. "Two plus two always equals four—there's no subjectivity there," she says. "With conflict minerals, it's totally different. It's more difficult to know if you're right or you're wrong. And that's another reason I like engineering—you can apply it to solve a problem and get to the answer."

Duran refers to the difficulty of actually knowing the source of the minerals that go into Intel's products. By taking an engineering approach, her team identified the point in the supply chain where they could definitively verify the source of the materials.

## CONFLICT MATERIALS

World attention has increasingly focused on "conflict minerals" from mining operations in the Democratic Republic of the Congo (DRC) and nearby countries. It is widely believed that those engaged in mining operations in this region commit serious human rights abuses against workers and use the profits from the minerals they produce to finance armed conflicts in the region. Many industry, government, and social advocacy groups are raising awareness and working for change. The US Congress and the Securities and Exchange Commission have established reporting requirements regarding conflict minerals. For more information on the issue, visit [intel.com/conflictfree](http://intel.com/conflictfree).

"We realized that the smelter is the pinch point," she explains. "If you test for the source of the raw material at the smelter site, you have your answer, and it doesn't matter where the minerals go afterward."

Getting the smelters to cooperate in the testing presented another problem. Duran says she had to muster all the creative thinking and communication skills she learned at McCormick to solve it. The team set up a program to certify smelters through audits that prove the materials they use are not sourced from militia-controlled mines.

The first audit occurred late in 2010. Today, more than 90 smelters in 21 countries have gone through the program, with many more now in the certification process. "Considering there are only a few hundred smelters in the world for these four metals, it's beginning to make a difference," Duran says. "And that includes an impact on the miners, who receive more money supplying to certified smelters than they did to the militias."

### Results that change peoples' lives

Knowing her team's efforts have paved the way for the global Conflict-Free Sourcing Initiative is gratifying to Duran. "There are reports of a 55 percent reduction of funds to the warlords in that region, because no one will buy minerals that haven't gone through the certification process," she says. "That's really what it comes down to—making a change on the ground. We basically applied engineering problem-solving skills to a humanitarian problem."

During her 16 years with Intel, Duran has helped solve many other problems as well. She started out in R&D and rose through the ranks to become director of supply chain ramp and regulations. Recently, Duran was named one of *Business Insider's* "22 Most Powerful Women Engineers in the World."

"I would never have thought when I joined Intel that I'd be working on something that would have such a global impact," she says. "You'll never be bored if you have the strong backbone that comes from the McCormick experience."

SARA LANGEN